Name: **Block**   **Mark:**   /60 **Grade:**

1.   A processor contains a number of special registers.

   (a) Explain the function of each of the following and describe how they are used:

      (i)   The program counter (PC)   [2]

      (ii) The current instruction register (CIR)   [2]

   (b) Name and describe the function of **three** buses used to carry information between the special registers.   [6]

2.   a)   A low-cost von Neumann machine has an address bus of 16 bits. In this computer, a unit of addressable memory is two bytes. How many KiB of addressable memory can be used?   [2]

   b)   (i)   Explain the basic difference between von Neumann architecture and Harvard architecture.   [2]

      (ii) Why is Harvard architecture potentially able to achieve higher processing speeds than von Neumann architecture?   [1]

      (iii) Give a typical use of each type of architecture.   [2]

3. (a) Describe the differences between a graphics processing unit (GPU) and a quad-core computer in a personal computer. [4]

    (b) Name **two** other applications, apart from graphics processing, for which a GPU, used in conjunction with a CPU, may be used. [2]

4. (a) Describe **three** factors which affect the performance of the CPU. [6]

    (b) Describe **two** differences between CISC and RISC architecture. [4]

5. A credit card company is trialling a new system of using a camera phone instead of a password to verify and authenticate a customer's identity when they make an online purchase.

    (a) Describe how this system might work. [3]

    (b) Describe **two** advantages of using this system rather than using a password. [2]

    (c) Describe **two** possible drawbacks of this system. [2]

6.   A list of storage devices is given below.

CD-ROM   **DVD**   **Hard Disk**   **USB Flash Memory stick**

Using the table below, state the typical capacity of each of the above devices.   [4]

Typical capacity	Storage medium
512 Megabytes – 128 Gigabytes	
512 Gigabytes – 4 Terabytes	
600 Megabytes – 700 Megabytes	
2.8 Gigabytes – 4.7 Gigabytes	

7. Describe the FETCH phase of the Fetch/Decode/Execute cycle mentioning any registers and buses and how they are used.   [6]

8. (a) Computer software is used in Geography lessons to teach students about weather systems

   (i) State the purpose of an input device in a computer system when using this software.   [2]

   (ii) State the purpose of an output device in a computer system when using the software. [2]

(b) State, with reasons, what type of printer you would recommend for the following applications.

   (i)   Invoice/delivery note printed on 3-part paper with 2 carbon copies.   [2]

   (ii)   Flyers produced by a small window-cleaning business to be delivered to all homes in a particular area   [2]

   (iii)   Producing high quality prints of a set of photographs   [2]

[Total 60 Marks]